

WHAT IS CLAIMED IS:

1. A method for the synthesis of a secreted heteromultimeric protein comprising at least two non-identical subunit polypeptide chains in a yeast diploid cell, the method comprising:
 - transforming a first yeast haploid cell with a first expression vector, said expression vector comprising a first subunit of said protein, operably linked to a first yeast promoter;
 - transforming a second yeast haploid cell with a second expression vector, said expression vector comprising a second subunit of said protein, operably linked to a second yeast promoter;
 - generating a diploid cell from said first and second yeast haploid cells;
 - culturing said diploid cell under conditions wherein said first and said second subunit are expressed and secreted as said multimeric protein.
2. The method according to Claim 1, wherein said yeast diploid cell is a *Pichia* species.
3. The method according to Claim 2, wherein said *Pichia* species is selected from the group consisting of *Pichia pastoris*, *Pichia methanolica*, and *Pichia angusta*.
4. The method according to Claim 1, wherein said heteromultimeric protein is an antibody comprising at least a variable region of a heavy and a light chain.
5. The method according to Claim 4, wherein said heteromultimeric protein is an antibody comprising at least a variable and a constant region of a heavy and a light chain.
6. The method according to Claim 4, wherein said first expression vector comprises a library of light or heavy chain sequences and said second expression vector comprises a single light or heavy chain sequence.
7. The method according to Claim 4, wherein said first expression vector comprises a library of light or heavy chain sequences and said second expression vector comprises a library of light or heavy chain sequences.
8. The method according to Claim 1, wherein said first and said second yeast haploid cells are complementary auxotrophs.

9. The method according to Claim 8, wherein said step of generating a diploid cell from said first and second yeast haploid cells comprises mating said haploid cells.
10. The method according to Claim 9, wherein said step of generating a diploid cell from said first and second yeast haploid cells comprises spheroplast fusion of said first and second haploid cells.
11. The method according to Claim 1, further comprising the step of calibrating the level of expression of said first or said second subunit prior to generating said diploid cell.
12. The method according to Claim 1, wherein said first yeast promoter and said second yeast promoter are the same.
13. The method according to Claim 1, wherein said first yeast promoter and said second yeast promoter are different.
14. The method according to Claim 1, wherein one or both of said yeast promoters are constitutive promoters.
15. The method according to Claim 1, wherein one or both of said yeast promoters are inducible promoters.
16. The method according to Claim 1, wherein said promoter is a GAP promoter.
17. The method according to Claim 1, wherein at least on said non-identical subunit polypeptide chains comprises an optimized signal sequence for diploid secretion and expression.
18. The method according to Claim 1, wherein said culturing step is performed in minimal media.
19. The method according to Claim 18, wherein said minimal media lacks selective agents.
20. The method according to Claim 1, wherein said culturing step is performed at a low temperature.

21. The method according to Claim 1, wherein said multimeric protein is secreted by said diploid cells to a concentration of at least about 100 mg/liter culture.